

**PATENT CLAIMS**

1. A system for providing thermal energy to a thermodynamic machine (3) for generating  
5       electrical power, comprising,  
      - a heat storage device (1) for storing thermal energy and a first heat transfer means (2)  
      for transferring thermal energy from the heat storage device (1) to the thermodynamic  
      machine (3),  
      - first heat generating means (4) for heating the heat storage device (1) with electrical  
10       power,  
      characterized in that the system comprises second heat generating means (5) for  
      providing thermal energy to the thermodynamic machine (3).
2. The system according to claim 1, characterised in that it comprises an intermittent  
15       renewable energy source such as wind power, or low-cost baseload electricity from a  
      power grid, as a source of electrical power for the first heat generating means (4).
3. The system according to claim 1, characterized in that the second heat generating  
      means comprise a second working fluid circuit with a second working fluid  
      connectable to the thermodynamic machine (3), and a controllable heat source (51) for  
      heating the second working fluid.
- 20   4. The system according to claim 3, wherein the first heat transfer means (2) comprise a  
      first working fluid circuit (21) with a first working fluid connectable to the  
      thermodynamic machine (3), characterized in that the second working fluid circuit and  
      the first working fluid circuit (21) are identical.
5. The system according to claim 1, characterized in that the first heat generating means  
25       (4) comprise an ohmic resistor (43) inside the heat storage unit (1) or a heat pump.
6. The system according to claim 1, characterized in that the heat storage device (1)  
      comprises a heat storage medium (11) which is in a solid state at a lower temperature  
      level of the storage device.
7. The system according to claim 6, characterized in that the heat storage medium (11) is  
30       in a solid state at the higher temperature level of the heat storage device.

8. The system according to claim 1, characterized in that the first heat transfer means (2) comprises a controllable heat resistance (25) for controlling the heat transfer.
9. A method for generating electrical power in response to an electrical power demand, comprising,
- 5       - heating a heat storage device (1) via first heat generating means (4) by converting electrical power from an electrical power supply exceeding an electrical power demand,
- transferring thermal energy from the heat storage device (1) to a thermodynamic machine (3) via a first heat transfer means (2), and/or providing thermal energy to the
- 10       thermodynamic machine (3) via second heat generating means (5) to meet an electrical power demand exceeding the electrical power supply.
10. The method according to claim 9, characterized in that the electrical power demand and/or supply do take into account economical considerations.